

REMARKS

Claims 1, 2, 4 to 30 and 32 to 68 to 10 are all the claims pending in the application, prior to the present Amendment.

Applicants have added new claims 69 and 70, based on the description on page 52, the first line, and Example 1 (Table 1 on page 87) of the present specification, respectively.

Claims 1, 2, 24-29, and 32 have been rejected under 35 U.S.C. 102(b) as being anticipated by WO 02/067357 to Murofushi et al.

Applicants submit that WO 02/067357 to Murofushi et al does not disclose or render obvious the presently claimed invention and, accordingly, request withdrawal of this rejection.

In the Office Action, the Examiner again refers to various paragraph numbers of Murofushi et al. The WO Murofushi et al document does not contain paragraph numbers, but the corresponding EP 1 363 348 document does contain paragraph numbers. Applicants continues to believe the Examiner is referring to the paragraph numbers of the corresponding EP document. Applicants request the Examiner to clarify the record on this point.

The present invention as set forth in claim 1 is directed to a metal oxide dispersion comprising metal oxide particles with a necking structure in a solvent, wherein the liquid droplet contact angle of the metal oxide dispersion to an ITO film (Indium-Tin Oxide type film) is from 0 to 60°, wherein the solvent comprises water and an alcohol.

According to the metal oxide dispersion of the present invention of claim 1, the solvent of the dispersion comprises water to expedite dispersion of the metal oxide particles therein, and the solvent further comprises an alcohol such that the metal oxide dispersion has an appropriate

liquid droplet contact angle to the ITO film. See page 50, sixth line from the bottom to page 52, line 6 of the present specification.

In particular, the present specification discloses at page 51, lines 10 to 32 as follows:

For dispersing the metal oxide particles, water is preferred, whereas for enhancing the wettability to the resin substrate, a hydrophobic solvent, particularly an alcohol, is preferred. Therefore, a mixture of water and an alcohol is a preferred solvent. In particular, when an aqueous solution comprising 40 mass% or more of ethanol is used as the solvent, good wettability to an electrically conducting resin substrate can be obtained and furthermore, when 60 mass% or more of ethanol is comprised, drying after coating can proceed at a higher rate and this leads to high productivity. Also, when the solvent for the metal oxide dispersion is a liquid obtained by incorporating 50 mass% or more of butanol into a volatile solvent comprising an alcohol, acetonitrile or the like having affinity for butanol, the produced metal oxide dispersion can have high viscosity at ordinary temperature and high affinity for the electrically conducting resin substrate and can be film-formed by vaporizing the solvent in the vicinity of 100°C and therefore, this is suitable as a metal oxide dispersion to be film-formed on an electrically conducting resin substrate by using a squeegee method or the like. (Emphasis added).

Regarding this, the wettability of an electrode substrate by a metal oxide dispersion is important in order to lower the resistance between the electrode substrate and metal oxide layer to be formed. See page 4, line 28 to page 5, line 3, and page 87, Table 1 of the present specification.

The effect of the combination of water and an alcohol is apparent from the comparison between Example 1 and Comparative Example 1 which is same as Example 1 except for using 50 g of water in place of 50 g of ethanol, i.e. not using ethanol as a solvent rather using water only as a solvent.

Murofushi et al do not teach or suggest the effect of a solvent comprising water and an alcohol in combination, although paragraph [0042] of Murofushi et al cited by the Examiner, which appears in European Patent No. 1,363,348 (A1), includes the following description:

[0042] As the solvent to used for the dispersion, any volatile liquids may be used without any limitation so far as it can promote the mixing of the metal oxide fine particles and the binder by dispersing metal oxide fine particles and at the same time dispersing, dissolving or swelling the binder. Specifically, volatile liquids having a hydroxy group, a carboxyl group, a ketone group, an aldehyde group, an amino group, or an amido group in the skeleton thereof are preferred. For example, water, methanol, ethanol, butanol, methyl cellosolve, ethylene glycol, acetic acid, acetylacetone, turpentine oil, and methylpyrrolidone may be used singly or as mixtures thereof.

As stated above, according to the dispersion of the present invention, water in the solvent improves dispersivity, while alcohol in the solvent improves wettability on a resin substrate.

Regarding this, the Examiner has concluded that the use of water-alcohol mixture as a solvent in a metal oxide dispersion is well known.

However, the dispersion of the present invention cannot use any kind of water-alcohol mixture as a solvent, but rather can use only the water-alcohol mixture which achieves the liquid droplet contact angle to an ITO film of from 0 to 60°. In other words, the solvent of the present dispersion is a water-alcohol mixture which contains a large amount of alcohol so as to achieve the desired liquid droplet contact angle. Regarding this, for example, the water-alcohol mixture of the present invention contains 40 mass% or more of ethanol (claim 4).

Although Murofushi et al suggest using a water-alcohol mixture as a solvent for a metal oxide particle dispersion, it does not teach or suggest controlling a composition ratio of the mixture so as to achieve particular properties. Accordingly, Murofushi et al do not teach or

suggest a metal oxide dispersion wherein the liquid droplet contact angle of the metal oxide dispersion to an ITO film (Indium-Tin Oxide type film) is from 0 to 60°.

Furthermore, Murofushi et al do not teach or suggest that water in the solvent improves dispersivity, and alcohol in the solvent improves wettability on a resin substrate. Therefore, since a person with ordinary skill in the art would have no criteria to optimize the composition ratio of an water-alcohol mixture, the present invention could not have been achieved on the basis of Murofushi et al.

Further, for a person with ordinary skill in the art, it is surprising that both dispersivity and wettability can be optimized by adjusting the composition ratio of a water-alcohol mixture solvent.

In view of the above, applicants submit that Murofushi et al do not disclose or render obvious the presently claimed invention and, accordingly, request withdrawal of this rejection.

The Examiner sets forth four additional rejections of various dependent claims over Murofushi et al as a primary reference. The four rejections are as follows:

(a) Claim 4 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Murofushi et al (WO 02/067357) as applied to claim 1 above.

(b) Claims 6 and 7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Murofushi et al (WO 02/067357) as applied to claim 6 above, and further in view of Wantanabe et al (EP 1271581) .

(c) Claim 8 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Murofushi et al (WO 02/067357) and Wantanabe et al (EP 1271581) as applied to claim 6 above, and further in view of Koyanagi et al (U.S. 6,849,797).

(d) Claim 30 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Murofushi et al (WO 02/067357) as applied to claim 1 above, and further in view of PG-PUB US 2003/0162016 to Tanaka et al. (PG-PUB US 2003/0162016).

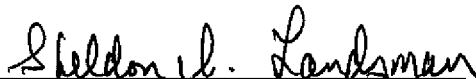
Claims 4, 6, 7, 8 and 30 are dependent claims that depend from claim 1. Accordingly, applicants submit that these claims are patentable over Murofushi et al for the same reasons as discussed above that claim 1 is patentable over Murofushi et al. The secondary references do not supply the deficiencies of Murofushi et al.

In view of the above, applicants request withdrawal of these rejections.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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